OBSERVATION OF STRUCTURAL CHANGES IN CARBON FILMS UNDER EXTERNAL INFLUENCES

Zh.R. Panosyan, A.V. Meliksetyan, A.S. Voskanyan,
Y.V. Yengibaryan, A.A. Sahakyan, A.T. Darbasyan
State Engineering University of Armenia, RA

The carbon films obtained by the method of plasma chemical deposition from the multicomponent stream of ionized particles on the various substrates surface are investigated. The photographs obtained with the help of electron microscope evidenced rising on the film surface the structural formations looks like direct parallel lines. The charge accumulation takes place apparently along these lines. When the film is exposed to the local thermal impact the micro tube-like structural peculiarities are formed along these lines. Observed peculiarities possess by the periodic structure with the well-defined constant period for both along the formations and between the formations itself.

The analysis of obtained results evidenced the possibility of coincidence of lines of charge accumulation with the micro tube-like formations. It is important to emphasize that the parameters of micro tube-like formations, that is their period and linear dimensions are controlled only by operating practices details and are independent on the type of external influence Fig.1.

The investigation of volt-ampere characteristics of sandwich-like structures on the base of Metal -carbon film-Si reveals the availability of irreversible breakdowns (Fig 2) connected apparently with structural changes. These changes are observed with the help of microscope and conditioned apparently by the strong electric field (~10^5-10^6 V/sm) influence.

Thus the the possibility to obtain the controlled micro and nano formation both on the surface and in the bulk of carbon films at the their deposition from multi component ion stream is established.

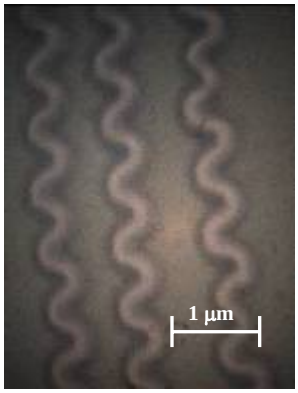

Fig.1

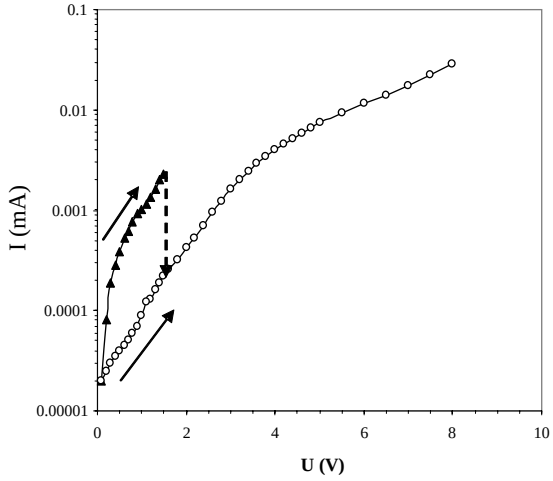

Fig.2